

INTERNATIONAL PRELIMINARY EXAMINATION REPORT


(PCT Article 36 and Rule 70)

Applicant's or agent's file reference C1435.01/P		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB 03/04486	International filing date (day/month/year) 15.10.2003	Priority date (day/month/year) 16.10.2002	
International Patent Classification (IPC) or both national classification and IPC G02B21/00			
Applicant PERKINELMER UK LIMITED et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and Industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 08.05.2004	Date of completion of this report 24.02.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Ward, S Telephone No. +31 70 340-3547



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EXAMINATION REPORT**

International application No. PCT/GB 03/04486

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-34 as originally filed

Claims, Numbers

1-31 filed with telefax on 27.01.2005

Drawings, Sheets

1/15-15/15 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☒ the claims, Nos.: 32-172
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 2-15, 17-31

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 2-15, 17-31

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1,16
	No: Claims	

Inventive step (IS)	Yes: Claims	
	No: Claims	1,16

Industrial applicability (IA)	Yes: Claims	1,16
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. For the reasons mentioned under item III, the reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability is limited to claims 1 and 16 (based on claims 1 and 97 as originally filed).
2. **Reference is made to the following documents:**
D2: US20020097490 A
D3: US4566029 A
D4: US4910606 A
D5: JP2266674 A
- 3.1 The subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT. The document D2 discloses (see e.g. figure 19): A method of imaging light from a specimen (40) in which excitation light passes to the specimen via a confocal scanning system and light emitted by luminescence (see paragraphs [0221], [0222]) of the specimen passes in the other direction via the scanning system to an image capture device (46) having a sensor having discrete spatially distinct light sensitive regions (a CCD camera, see paragraph [0221]), and the scanning system is operated so as to scan the whole of an area of interest of the specimen, wherein the scanning system and the image capture device are controlled by a controller (86,78), so that the light emitted from the specimen is incident on the image capture device for a specific time period equal to that required for scanning the whole of the area of interest n times, where n is a whole number equal to or greater than 1 (i.e. the time periods determined by sectors 102a,102b etc. in fig 20).
- 3.2 A further feature of claim 1 is that "the scanning system, and the excitation light and/or the image capture device are controlled by a **controller programmed to act as a state machine**". The term "state machine" refers to a very general model in computer science which may be implemented in many ways. The application gives one detailed implementation of a state machine (page 26, final paragraph, pages 27-32 and fig 4). However, many other implementations are possible, and in particular it is well known that a general purpose digital computer can be regarded as satisfying all the defining criteria of a "state machine", and therefore one possible implementation of a "state machine" is a

computer, e.g. computer (18) in figure 19 of D2. Hence in D2 the scanning system and the image capture device are controlled by a controller which is programmed to act as a state machine.

- 3.3 Claim 1 therefore differs from D2 in that the scanning system and the excitation light and/or the image capture device are controlled by a controller, so that the light emitted from the specimen is only incident on the image capture device for a specific time period equal to that required for scanning the whole of the area of interest n times, where n is a whole number equal to or greater than 1.
- 3.4 In D2, outside the scanning periods relatively little light will be reflected from the disk to the image capture device (as a result of the black sectors, e.g. 102d, 102e, 102f in fig 20), but other light (e.g. stray light coming directly from the source (30) in fig 19) may still be incident on the image capture device even in the non-scanning periods.
- 3.5 It is commonly known in the field of video imaging that solid state image capture devices, such as the CCDs of D2, suffer from a problem referred to as "smear", "dark charge" or "dark current", whereby during the charge transfer period when the camera should not be performing an exposure operation, light incident on the device nevertheless results in some extra unwanted charge being produced which is detrimental to the image. The problem associated with claim 1 may therefore be seen as reducing image errors (see the description of the present application, page 6, paragraph 2).
- 3.6 A solution to this problem is also well known in the art, namely to allow light to be incident on the image capture device only in the exposure periods, and to prevent light from being incident on the image capture device in the non-exposure periods. In implementing such a solution in the context of D2, it would be obvious for the skilled person to use the control arrangements (78,86) to apply the appropriate synchronization signals. Hence, starting from D2 and applying this commonly known solution to overcome the above-mentioned problem of "smear", the person skilled in the art would arrive, in an obvious manner, at the features of claim 1. Hence claim 1 lacks inventive step (Article 33(3) PCT).
- 3.7 For purposes of illustration, the following documents provide examples of overcoming the problem of "smear" by preventing light from being incident on the image capture device in the non-exposure periods:

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- D3: uses rotary chopper (see abstract, figures).
 - D4 uses LC, PLZT, mechanical or rotary shutter (see column 6, lines 28-33)
 - D5 uses LC shutter (see abstract, figures).
4. The features of Independent apparatus claim 16 correspond to those of method claim 1, and hence claim 16 does not involve an inventive step in the sense of Article 33(3) PCT for the reasons given above, *mutatis mutandis*.
5. Furthermore, it is pointed out that claim 1 implies that light is only incident on the image capture device for "a specific time period". In the description it appears that light is incident on the image capture device during several time periods corresponding to periodic exposures (see e.g fig 6a). This contradiction between the claims and description is contrary to Article 6 PCT.

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Minnie Wilson

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